

CLAIMS

1. A process for making an electronic device comprising a dielectric substrate laminated with an electrically conductive metal or alloy which comprises applying a non-aqueous etch-resistant ink by ink jet printing to selected areas of the metal or alloy, exposing the etch-resistant ink to actinic radiation and/or particle beam radiation to effect polymerisation, removing exposed metal or alloy by a chemical etching process and then removing the polymerised etch-resistant ink by alkali wherein the etch-resistant ink is substantially solvent free and comprises the components:

10      A) 30 to 90 parts acrylate functional monomers free from acid groups comprising mono or higher functionality wherein 5 – 95% by weight is one or more mono-functional monomers;

      B) 1 to 30 parts acrylate functional monomer containing one or more acid groups;

      C) 0 to 20 parts polymer or prepolymer;

15      D) 0 to 20 parts radical initiator;

      E) 0 to 5 parts colorant;

      F) 0 to 5 parts surfactant; and

wherein the ink has a viscosity of not greater than 30 cPs (mPa.s) at 40°C and all parts are by weight.

20      2. A process as claimed in claim 1 wherein the amount of mono-functional acrylate monomer is 70 - 95% by weight of component A).

25      3. A process as claimed in either claim 1 or claim 2 wherein the amount of component B) is not greater than 10 parts.

4. A process as claimed in any one of claims 1 to 2 wherein the amount of component B) is not less than 6 parts.

30      5. A process as claimed in any one of claims 1 to 4 wherein component B) is acrylic acid or mono-2-(methacryloyl)ethyl phthalate.

6. A process as claimed in any one of claims 1 to 5 wherein the radical initiator is a photoinitiator activated by UV light.

35      7. A process as claimed in any one of claims 1 to 6 wherein the ink has a surface tension of from 20 to 40 mN/m.

8. A process as claimed in any one of claims 1 to 7 wherein the viscosity of the ink is from 8 to 20 cPs (mPa.s) at 40°C.

5 9. A process as claimed in any one of claims 1 to 8 wherein component B) has an acid value of not less than 100mg KOH/g.

10 10. A process as claimed in any one of claims 1 to 9 wherein the total etch-resistant ink has an acid value greater than 30 mg KOH/gm.

11 11. A process as claimed in any one of claims 1 to 10 wherein the amount of polymer or prepolymer (component C)) is zero.

12 12. A process as claimed in any one of claims 1 to 11 wherein the amount of radical initiator is not less than 0.1 parts.

15 13. A process as claimed in any one of claims 1 to 12 wherein the number of parts of components A) + B) + C) + D) + E) + F) = 100.

20 14. An electronic device comprising a dielectric substrate and an electrically conductive metal or alloy which is partially coated with a non-aqueous etch-resistant ink composition by a process as claimed in any one of claims 1 to 13.

25 15. An electronic device as claimed in claim 14 which has been exposed to actinic radiation.

16. An electronic device as claimed in either claim 14 or claim 15 which is a printed circuit board.

30 17. A non-aqueous etch-resistant ink for ink jet printing which is substantially free from organic solvents which comprises:

A) 30 to 90 parts acrylate functional monomers free from acid groups comprising mono or higher functionality wherein 5 - 95% by weight is one or more mono-functional monomers;

B) 1 to 30 parts acrylate functional monomer containing one or more acid groups;

C) 0 to 20 parts polymer or prepolymer;

D) 0.1 to 20 parts radical initiator;

E) 0 to 10 parts colorant;

F) 0 to 5 parts surfactant; and

wherein the ink has a viscosity of not greater than 30 cPs (mPa.s) at 40°C and all parts are by weight.

18. A non-aqueous etch-resistant ink for ink jet printing which is substantially free from organic solvents which comprises:

- A) 30 to 90 parts acrylate functional monomers free from acid groups comprising mono or higher functionality wherein 5 - 95% by weight is one or more mono-functional monomers;
- B) 1 to 30 parts acrylate functional monomer containing one or more acid groups;
- C) 0 to 20 parts polymer or prepolymer;
- D) 0.1 to 20 parts radical initiator;
- E) 0 to 10 parts colorant; and
- F) 0 to 5 parts surfactant;

wherein the ink has an acid value of greater than 30 mg KOH/gm and less than 120mg KOH/gm and all parts are by weight.

19. An ink as claimed in either claim 17 or claim 18 wherein the acid group(s) of the acrylate functional monomer of component B) contains a carboxylic acid group(s).

20. An ink as claimed in any one of claims 17 to 19 wherein the number of parts of components A) + B) + C) + D) + E) + F) = 100.

21. A cartridge comprising a chamber and an ink wherein the ink is present in the chamber and the ink is an etch-resistant ink as claimed in any one of claims 17 to 20.